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A NEW JURASSIC MAMMAL

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One of the secondary objectives of the American Museum expedition of 1897 was to seek mammals in the Morrison Formation of Wyoming. Marsh's famous Jurassic mammal locality, Quarry 9 at Como Bluff, Wyoming, was reopened and several tons of matrix were quarried out and worked over locally during the following winter. Many bone slivers and reptile teeth and small jaw fragments were found, but the effort was written off as a failure as far as mammals were concerned and the apparently valueless material was put away at the Museum and forgotten. Now nearly forty years later it is found that one of the small jaws that was half hidden in matrix in this lot of material is a mammal, and one of unusual importance. It belongs to one of the rarest Jurassic families, Paurodontidae, and reveals a hitherto unrecognized genus and species.

This remarkable discovery is all the more welcome and unexpected, since it was believed that all the available Jurassic mammal specimens had been located and examined in the course of my work on this subject in 1923–1927, and, since, new field discoveries have not been forthcoming. Professor Osborn also had been very active in this field years before, especially in 1887–1888, before this specimen was actually collected, but also until about 1907 (after which he devoted most of his time to the more advanced mammals). He was particularly anxious to obtain such specimens for the Museum, and it is ironic that work planned by him for this purpose did indeed obtain one of outstanding importance and that he was never aware of this fact.[1]

The history of discovery of Jurassic mammals, in which the present specimen must occupy a peculiar place, is in any event a strange one. The first discovery, but not recognition, was made in 1764, before there was a science of vertebrate paleontology, and the rediscovery or in a true sense the real discovery (1812 or 1814) and the first publication (1824) were contemporaneous with the rise of the infant science. Thereafter

[1] This appears actually to be the only Jurassic mammal ever collected for the American Museum. Its collections include a few jaws, of less interest as merely duplicating better specimens in the Marsh Collection, but these were part of the Cope Collection. They were obtained for Cope at Como Bluff, and presumably from Quarry 9, by F. H. Williston in 1880 (that is, while Marsh was working the quarry).

new discoveries rapidly piled up first in England (mostly before 1871) and then in the United States (principally 1878–1886), until there were in museums literally hundreds of these little jaws, which nevertheless are rightly considered among the rarest of fossils. Then the flood of discovery abruptly ceased and so far has never been resumed. The known localities have been intensively reworked, with very little result. In spite of the subsequent extension of collecting activities to the whole world and of constantly accelerated rate of discovery in almost every other field of vertebrate paleontology, no new localities of any importance have been found, and the number of Jurassic mammals collected in the last fifty years is negligible. As far as I know, only two Jurassic mammal specimens have been found in the present century, and none in the last twenty years, if one excepts the present specimen which might be said to have been found in 1897 and discovered in 1936.[1]

This delicate specimen has been skilfully prepared by Mr. Albert Thomson and illustrated by Mr. John C. Germann.

PANTOTHERIA

Paurodontidae

ARAEODON,[2] NEW GENUS

TYPE.—*Araeodon intermissus*, new species.

DISTRIBUTION.—Morrison Formation, Jurassic, Wyoming.

DIAGNOSIS.—Cheek teeth seven or eight, probably P_3 M_4. $P_{?1}$ minute, following tooth large, typically premolariform. $M_{?1}$ (fourth tooth counting from posterior end of series) molariform, with small and low but distinctly cuspidate paraconid and metaconid subequal in height, paraconid projecting anteriorly and shelflike, talonid very small, subtriangular, internal, unbasined. Two roots of each molar subequal. M_4 somewhat reduced in size.

The probable presence of seven cheek teeth (surely not over eight), relatively elongate trigonids, single-cusped and unbasined molar talonid, two subequal molar roots, and relatively short and stout jaw all show that this genus definitely belongs in the Paurodontidae. It appears to be rather closely related to the typical genus of that family.

The paurodontid genera previously known from lower teeth are *Peramus* of the English Purbeckian and *Paurodon*, *Archaeotrigon* and *Tathiodon* of the American Morrison. Confusion with *Peramus* is impossible, and close comparison is unnecessary. In that genus the jaw is

[1] The only possible exception to this statement known to me is the discovery of some specimens in the Jurassic of Argentina which may have been mammalian but were not demonstrated to be so. They were never described or figured and have been irretrievably lost.

[2] Ἀραιός, weak, ὀδούς, tooth.

more slender and elongate than in *Araeodon*, the dental formula is probably significantly different, and the molar structure is very distinct.

In *Paurodon* the number of cheek teeth is six, surely less than in *Araeodon*, the teeth are widely spaced, with a post-canine diastema whereas they are in continuous series in *Araeodon*, and the internal molar cusps are less distinct than in *Araeodon*. In *Archaeotrigon* the arrangement of the teeth and also the molar structure are closer to *Araeodon*, but the talonid is larger, more semicircular and less internal, the metaconid is higher than the paraconid, and the cheek tooth formula, of the genotype, P_2 M_3, is different. In *Tathiodon* the internal molar cusps are much more strongly but unequally developed and the whole structure more similar to the dryolestids than in *Araeodon*. Of the three previously known American genera, *Araeodon* seems most closely to resemble *Archaeotrigon*, but the genera are evidently distinct. It is possible that the referred species *Archaeotrigon distagmus*, in which there appear to have been four molars but the formula otherwise is unknown, will prove to belong to *Araeodon*. Its molar structure seems, however, closer to that of *Archaeotrigon brevimaxillus* than of *Araeodon intermissus*.

Araeodon intermissus,[1] new species

TYPE.—Amer. Mus. No. 27775, right lower jaw with three teeth, probably P_{1-2} and M_1, and alveoli.

HORIZON AND LOCALITY.—Morrison Formation, Quarry 9, Como Bluff, Wyoming.

DIAGNOSIS.—Sole known species of genus. Description and measurements below.

The striking superficial characters of this little jaw are its minute size, the small size of the teeth in comparison with the jaw and (in comparison with most pantotheres but not with most of the more familiar Tertiary mammals) its short jaw and small number of teeth.

The anterior alveoli are obscure. There were evidently incisor alveoli, but their number and arrangement cannot be surmised with any assurance. Immediately anterior to the first tooth preserved is a slightly crushed area that seems with considerable probability to involve a single alveolus larger than that for the preserved tooth, and hence probably for a canine. If for a premolar, this must have been the first.

The first tooth preserved, which thus seems to be P_1, is very small. The root is single at the mouth of the alveolus, but is elongate anteroposteriorly and with traces of division, so that it may divide deep in the alveolus. The crown is relatively low, elongate, and slightly procum-

[1] *Intermissus*, put off, neglected.

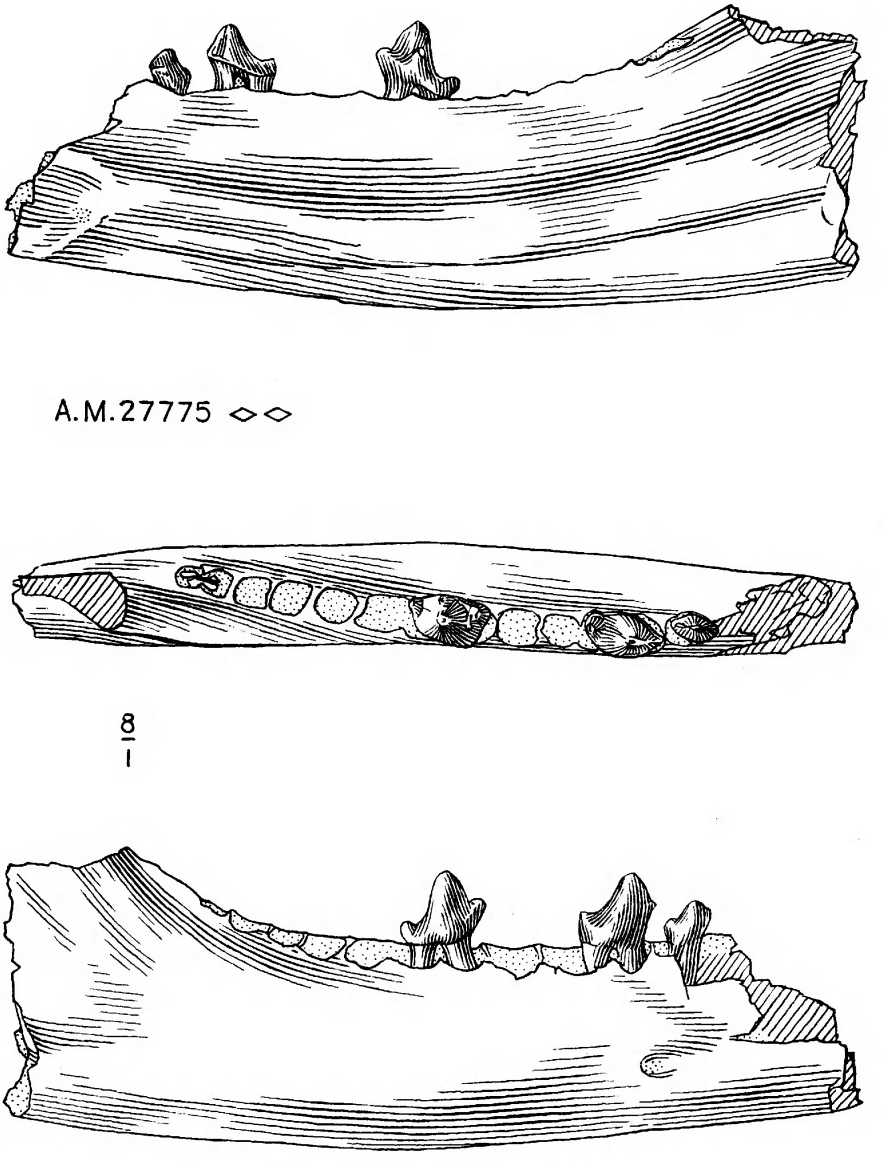

Fig. 1. *Araeodon intermissus*, new genus and species.

Type, American Museum No. 27775, right lower jaw. Internal, superior and external views. Eight times natural size.

bent. The external face is smooth and slightly bulbous. The internal face has a vague basal swelling, hardly definite enough to be called a cingulum, ending anteriorly in a faint rudiment of a cuspule. The main portion of the crown is followed by a very small heel with one tiny cuspule.

The next tooth, probably P_2, is much larger and has two subequal, well-separated roots. The crown is closely similar in form to that of P_1, but its structure is more definite. There is a narrow but distinct internal cingulum, the anterior end higher than the posterior, meeting the anterior border almost at a right angle. At this point is an angulation or rudimentary cuspule. Poorly developed semitrenchant crests descend anteriorly and posteriorly from the main apex. The heel bears a small but definite cuspule.

This tooth is followed by two alveoli, suggesting a tooth of about the same size or slightly larger. Identification of this tooth must be largely conjectural, but it seems slightly more probable that it was a premolar, in which case the formula was:

$$\frac{?.1.3.4.}{}$$ [1]

The next tooth is clearly a molar, and is tentatively designated M_1. It is implanted by two subequal roots. The trigonid is relatively very large, moderately elevated, and longer than broad. The external face is simple and convex. The protoconid has the usual asymmetrically triangular form, with feeble crests to paraconid and metaconid. The metaconid is internal to the posterior part of the protoconid, with which it is basally confluent, only the apex being distinct. From the alveolar border, this apex is at about two-thirds the height of the protoconid and it is simple and rather blunt. The paraconid projects anteriorly, somewhat anterointernally, and is shelflike, but is a distinct cusp similar to and about as high as the metaconid. It is feebly crested along the internal margin of the tooth, posteriorly from the apex, tending to make a trigonid basin which is, however, only in most rudimentary form. The talonid is low and very small. In plan it is like a tab or ear, subtriangular and wholly on the internal half of the tooth, and is unbasined and slopes downward externally as in most pantotheres. The cuspule is worn, but must have been minute and inconspicuous even when complete.

From their alveoli, M_2 and M_3 were about equal to each other and slightly larger than M_1, while M_4 was the smallest of the molars, with

[1] Within the Pantotheria, this agreement with the marsupial formula can only be considered accidental, or convergent, if it is confirmed. Its only broad significance would be to demonstrate that pantotheres could give rise to such a formula, and this would hardly be doubted in any event.

the posterior root smaller than the anterior. The coronoid arose immediately posterior to M_4, but at a low angle. Indeed the alveolar mouths of M_4 are tilted and on the base of the gently rising coronoid.

There is the usual paurodont type of short, rugose, unfused symphysis. The posterior mental foramen is beneath the anterior root of P_2. The masseteric fossa is shallow and its pointed anteroinferior end is bounded by a rounded and rather vague margin. The internal groove is well defined, evenly curved, simple, and continuous to the posterior end of the symphysis.

The tooth dimensions in millimeters are:

P_1		P_2		M_1	
L	W	L	W	L	W
0.4	0.2	1.0	0.6	1.1	0.7

Depth of jaw internally beneath M_2 : 3.4.